

AMENDMENTS TO THE CLAIMS

1-52. (Cancelled)

53. (Previously presented) A method for solid-state friction stirring of a surface of a high melting temperature material, said method comprising the steps of:

- (1) providing a friction stirring tool having a friction stirring surface;
- (2) disposing a superabrasive material on the friction stirring surface; and
- (3) friction stirring the surface of the high melting temperature material using a solid-state process wherein the high melting temperature material substantially avoids a liquid state.

54. (Previously presented) The method as defined in claim 53 wherein the method further comprises the step of allowing the high melting temperature material to at least partially experience a liquid phase.

55-60. (Withdrawn)

61. (Previously presented) The method as defined in claim 53 wherein the method further comprises the step of friction stir processing the high melting temperature material to thereby alter the characteristics of the high melting temperature material through substantially solid-state processing.

62. (Previously presented) The method as defined in claim 53 wherein the method further comprises the step of friction stir processing the high melting temperature material to thereby alter the characteristics of the high melting temperature material through partial liquid phase processing.

63-66. (Withdrawn)

67. (Previously presented) A method for friction stir processing a surface of a high melting temperature material, said method comprising the steps of:

(1) providing a friction stir processing tool having a friction stir processing surface;

(2) disposing a superabrasive material on the friction stir processing surface; and

(3) friction stir processing the surface of the high melting temperature material to thereby alter the characteristics of the high melting temperature material through substantially solid-state processing of the high melting temperature material.

68-76. (Withdrawn)

77. (Previously presented) A method for friction stir mixing a surface of a high melting temperature material through substantially solid-state processing, said method comprising the steps of:

(1) providing a friction stir mixing tool having a friction stir mixing surface;

(2) disposing a superabrasive material on the friction stir mixing surface; and

(3) friction stir mixing a second material into the surface of the high melting temperature material to thereby alter the characteristics of the high melting temperature material through substantially solid-state processing of the high melting temperature material and the second material.

78-99. (Withdrawn)

100. (Previously presented) A method for joining a first high melting temperature material to a second high melting temperature material through substantially solid-state processing, said method comprising the steps of:

(1) providing a friction stirring tool having a friction stirring surface;

(2) disposing a superabrasive material on the friction stirring surface; and

(3) friction stirring the first high melting temperature material to the second high melting temperature material, wherein the first high melting temperature material and the second high melting temperature material are functionally friction stirred together using a substantially solid-state process.

101. (Withdrawn)

102. (Previously presented) The method as defined in claim 101 wherein the method further comprises the step of friction stir welding the first high melting temperature material to the second high melting temperature material using the substantially solid-state process.

103. (Previously presented) The method as defined in claim 102 wherein the method further comprises the step of friction stir processing the first high melting temperature material and the second high melting temperature material using the substantially solid-state process.

104. (Previously presented) The method as defined in claim 103 wherein the method further comprises the step of friction stir mixing a second material with the first high melting temperature

material and the second high melting temperature material using
the substantially solid-state process.